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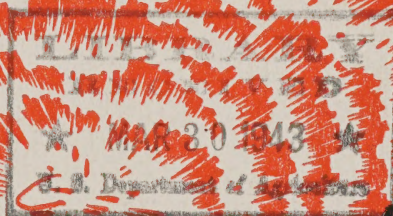
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6237

Carnations

THE NEW CARNATION

219437



6237

PIPER'S

LIVINGSTON,
NEW JERSEY

FOREWORD

We believe that in these troubled and uncertain days we can be of greater service to you than ever before. The average florist has lost a large percentage of his skilled employees. In some cases this loss has been almost fatal to the business. In hundreds of instances, owners are deeply concerned as to their ability to properly attend to their crops. Many growers will find that they do not have enough skilled men to care for their plants and to propagate their stock for next season.

That is where we come to your assistance. For three decades we have been propagating and selling carnations. We have introduced many new varieties. We have shipped carnation plants all over the world. We know how to do the job properly. You will find it to your advantage to let us propagate your carnations for next season while you devote your time to caring for the plants in your greenhouses. You can purchase your carnation cuttings almost as cheaply as you can produce them yourself, and a lot of valuable labor can be diverted to other important work.

Oh, yes! We have had our labor problems, too. However, we have trained a large force of young women to do many of the routine tasks in the greenhouses, thereby relieving our skilled employees and making them available for the important work of propagating.

Although we expect to propagate more than three quarters of a million cuttings this winter, we will not lower our standards, and will take only as many cuttings as we can handle properly. Thus it will be to your further advantage to place your order early for then if we find that we cannot accomplish quite as much as we had planned, and are obliged to turn down some late orders, your order will be recorded and will be taken care of.

Forty of the best commercial varieties available are offered for your selection. Every one of these has been thoroughly tested and has been successfully grown by enough growers in various sections to warrant it being included in our list. Not every one will do equally well with you, but each one is a good variety. We guarantee that every cutting you receive will be clean, well-rooted and properly packed.

WHITE VARIETIES

OLIVETTE. This splendid pure white carnation has met with favor in all sections of the country where it has been tested. The advance demand for it this season is the largest we have had, and many of these early orders are repeat orders from those who purchased the variety last year. The flowers are beautifully formed, with high, full centers. The blooms are delicately scented and are of medium size. The long, narrow calyx almost never splits. Production is heavy. The flowers keep and ship perfectly. The variety is best when grown indoors, and it requires a little more water than the average variety. Many growers have made OLIVETTE their standard white carnation.

\$8.00 per 100 \$70.00 per 1000

WHITE PETER FISHER. For two seasons the demand for this pure white sport of Peter Fisher has exceeded our expectations. This season we have made provisions to produce more cuttings of it than at any previous time. It is a truly profitable carnation. The variety has the same growing habits as Peter Fisher, and is identical in every respect except color. The petals are deeply fringed, and resemble the variety Ivory, but the stems and foliage are much heavier. It is one of the "bread and butter" varieties.

\$8.00 per 100 \$70.00 per 1000

WHITE MAYTIME. No carnations grown today have lovelier form than the several Maytime varieties. They are above average size, are full-centered, and are very attractive. WHITE MAYTIME is exactly like the variety Maytime, from which it sported, except that it is pure white at all times. The petals are slightly fringed, the blooms are very fragrant, production is high, and keeping qualities are unsurpassed. For further details, see the description of the variety Maytime.

\$7.50 per 100 \$65.00 per 1000

PURITAN. In spite of the introduction of many good new white carnations, PURITAN continues to hold its own as a profitable commercial white. Production is heavy and uniform, the flowers are of good size and are fine keepers and shippers, the blooms are delightfully fragrant, and the variety is very easy to grow. Splitting is very rare. The stems are long. The color is uniform throughout the season.

\$6.00 per 100 \$50.00 per 1000

PATRICIAN. This is another well-known white which refuses to be pushed out of the picture by later introductions. Its qualities are such that it continues to be widely grown and highly regarded. The blooms are large, are of high quality, and are produced in quantity. They keep and ship well, and are borne on long, stiff stems. The flowers are especially fine in the Spring. Plants are large and bushy. Some splitting occurs, but this is not serious. A slight flaking appears during the winter months, but this does not detract from the flower.

\$6.00 per 100 \$50.00 per 1000

Prices in this catalogue cancel all previous price lists.

LIGHT PINK VARIETIES

HERCULES VIRGINIA. This is a sport of the variety Virginia. The plants have the same characteristics as those of the parent variety. The flowers are of the same form and color, but are much larger and fuller. When the variety is at its best during the winter and spring months, the flowers are easily twice the size of the Virginia blooms. Our supply of this variety is very limited this season.

\$15.00 per 100

\$125.00 per 1000

MAYTIME. A beautiful, rich shell pink with high, full centers. There is no lovelier formed carnation than MAYTIME. The plants are tall and erect, with no grassy growth at all. Closer planting is possible with this variety because of its tall, straight growth. The stems are long. Production is high. The flowers are unsurpassed for keeping quality, and they maintain this quality and their color and size better than any other variety in this color class during the warm spring months. The variety is easy to propagate and grow. At certain definite periods the variety will split, but this splitting does not occur throughout the season. Usually at the time that splitting occurs, the stems are more or less brittle. In spite of these defects, MAYTIME continues to be the most profitable variety we have grown for many years, and we have averaged better than 40 blooms per square foot of bench for several years.

\$7.00 per 100

\$60.00 per 1000

HERMOSA. An attractive, vivid light pink. The color is much deeper and brighter than that of Virginia, but not as deep as that of Ward. The flowers are large, and keep well. Production is good. The plants are vigorous, and bush up well although they are not as tall as Maytime nor as sturdy as Virginia. It is one of the prettiest carnations in the light pink class, and is especially recommended for those who have difficulty with Maytime or Virginia.

\$7.00 per 100

\$60.00 per 1000

VIRGINIA. This carnation is so widely grown that no description is necessary. The flowers are of Enchantress pink, are of medium size, have fringed petals, and are borne on stiff stems of medium length. Production is good. The calyx never splits.

\$7.00 per 100

\$60.00 per 1000

RUTH HENGSTENBERG. Is slightly deeper in color than Virginia. The flower is larger and fuller than that of Virginia, and production is higher. The stem is not as stiff, and some splitting occurs. The variety is recommended as a substitute for Virginia for those who cannot grow the latter variety.

\$6.00 per 100

\$50.00 per 1000

MINA BRENNER. A flesh pink sport of Boston Ward having all of the characteristics of the Ward varieties. It is an attractive color and a popular variety. The flowers are of medium size, and are borne on good stems. The plants are bushy and vigorous.

\$6.00 per 100

\$50.00 per 1000

MEDIUM PINK VARIETIES

ROSE CARESS

An Outstanding New Seedling

This splendid new seedling was originated by the U. S. Department of Agriculture, and is the finest carnation that the Department has ever sent out. It has been disseminated through the S. A. F. & O. H., and those growers who offer it for sale this year have paid a royalty to grow it, and pay 40% of the gross receipts from its sale to the S. A. F. & O. H. and to the American Carnation Society. This money will be used for research in carnation growing. The variety was adequately tested before being offered for sale. The cut on the opposite page shows clearly the form and appearance of the bloom.

The color is a fine rose pink, similar to that of Pink Treasure when that variety is at its best. The flowers are large and full and are beautifully formed. The stems are long and strong, and we have yet to discover a split calyx. The blooms keep and ship splendidly. They were recently displayed at a flower show in Boston where they lasted perfectly through a five day show and where they were given an Award of Merit. The plants are large and bushy, and are perfectly clean and vigorous. Our production figures were taken from only a few plants last year, and these were very satisfactory. From these figures, and from the appearance of the plants this year, it is safe to say that production is well above the average. This variety did well with us last year, and is very much improved this season.

\$15.00 per 100

\$125.00 per 1000

GIANT PETER FISHER. This is a sport of Peter Fisher. It is the same color and form as Peter Fisher, but is much larger. The larger, fuller flowers make it a more valuable variety than Peter Fisher. Slight splitting occurs. Production is about the same as that of Fisher. Our supply of this variety is limited this season.

\$12.00 per 100

\$100.00 per 1000

VIRGINIA ROSE. This is a medium, or rose pink, sport of Virginia. The color is far more appealing than that of Virginia, and the variety is extremely popular. Except for color, it is identical to Virginia. The color is deeper than that of Peter Fisher, but is quite a lot lighter than that of Ward.

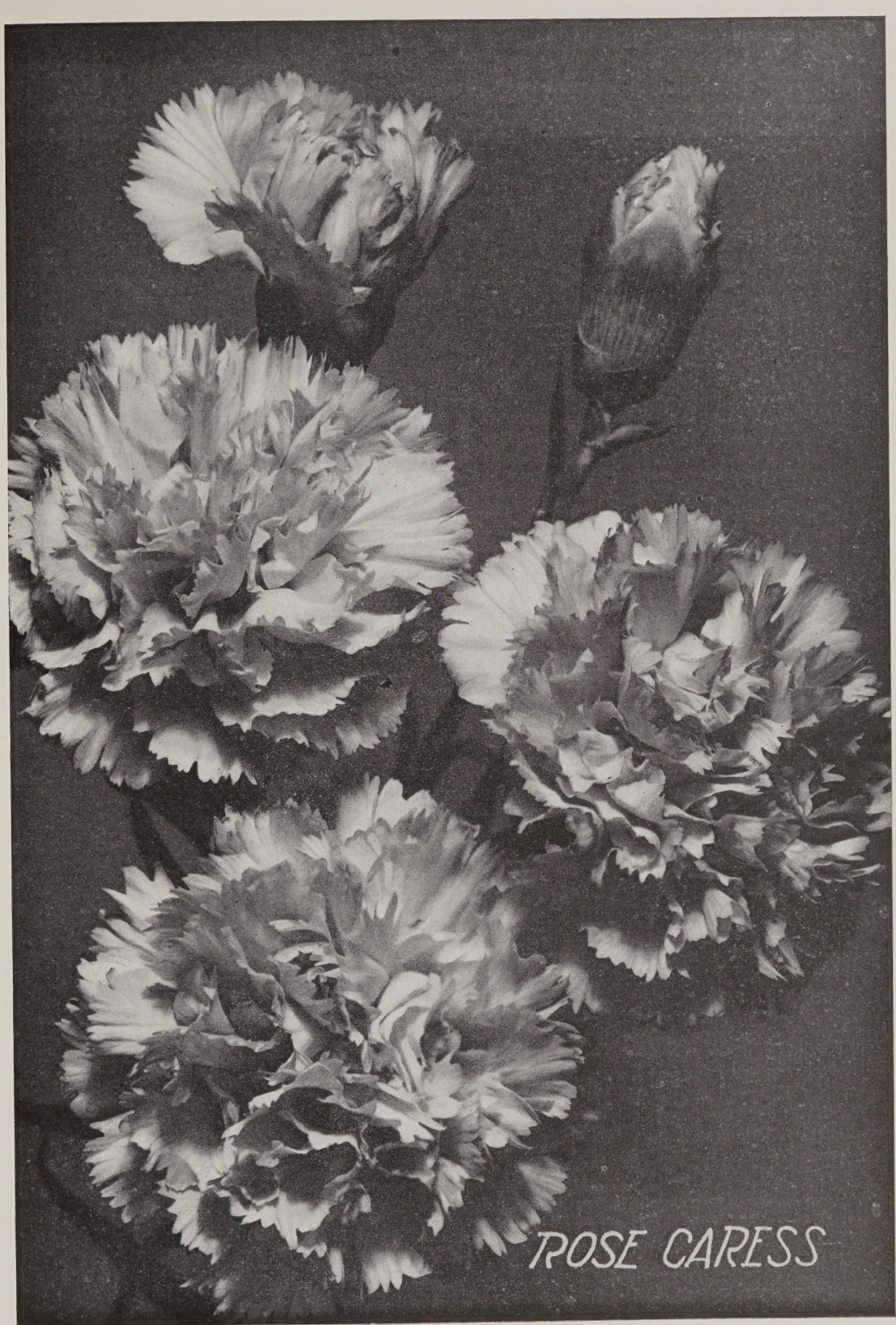
\$8.00 per 100

\$70.00 per 1000

PETER FISHER. Probably the most prolific and popular of the medium or rose pink varieties. The flowers are of medium size, of good substance, and have deeply fringed petals. The stems are long and strong, the calyx does not split, and the flowers keep to perfection. The plants are large and bushy, but run up quite tall. This is one of the easiest varieties to grow, and is not usually attacked by either insects or diseases. The flowers are at their best at the time of the Spring holidays when most pink varieties have started to fade.

\$6.00 per 100

\$50.00 per 1000



ROSE CARESS

DARK PINK AND SALMON PINK VARIETIES

DARK PINK PETER FISHER. (*Illustrated on opposite page*). One of the most valuable introductions in recent years, and a variety that is destined to become widely grown and standard in this color class. It is a true deep pink, almost exactly the same shade as Boston Ward. Its characteristics and growing habits are the same as those of Peter Fisher, from which it sported. We have a good supply of this variety, but the demand this season is certain to be greater than we can cope with. Therefore, we urge you to order this variety early.

\$10.00 per 100 \$90.00 per 1000

JOHN BRIRY. A new dark pink carnation of exceptional quality. The plants are very large and bushy. The stem is unusually long and strong. The variety does not split, and is an excellent keeper. The flowers are above average size, are symmetrical and of good substance. Production is not as high as that of many of the commercial varieties, but JOHN BRIRY will almost always command higher prices.

\$8.00 per 100 \$70.00 per 1000

DARK PINK MAYTIME. A deep pink sport of Maytime that has the same characteristics as the parent variety. The flowers are a little larger than those of Maytime or White Maytime, but have the same delightful form as the other Maytime varieties. There is no deep pink carnation that can surpass it in color, form, productiveness and general quality. It has the same habit of splitting and being slightly brittle at certain periods, but this is offset by its productiveness and the high percentage of perfect flowers over most of the season. If planted 6x6, or not more than 6x7, it will consistently yield 40 blooms or more per square foot of bench.

\$7.00 per 100 \$60.00 per 1000

DIRIGO. A fine deep pink in the same color class with John Briry. The plants are large and bushy, the stem is very long and strong. Very little splitting occurs, and production is good. The flowers keep well.

\$7.00 per 100 \$60.00 per 1000

NEW DEAL WARD. This is a selected and improved Boston Ward. The color is slightly deeper than that of Boston Ward, and the plants are a little more vigorous. Otherwise the characteristics are the same as those of Boston Ward. It is widely grown, and is an important commercial deep pink.

\$6.00 per 100 \$50.00 per 1000

GIANT LADDIE. A deep salmon pink sport of Laddie with larger flowers and more vigorous growing habits. It is of show quality, and is ideal for the discriminating grower with a select trade. The flowers are gorgeous, and are carried on long, stiff stems. Production is good for such a large flower.

\$9.00 per 100 \$80.00 per 1000

ELEANOR. A light salmon pink of good quality. Flowers are of medium size, are symmetrical and have high, full centers. The plants are large and bushy and produce well. The flowers are good keepers. The color is much deeper than that of Mina Brenner, but not as deep as that of Giant Laddie. The stems are long and quite strong. It is a shade that sells well.

\$6.00 per 100 \$50.00 per 1000



*DARK PINK
PETER FISHER*

RED AND CRIMSON VARIETIES

BARBARA FARR. A scarlet sport of Spectrum Supreme, slightly lighter in color than that variety, but freer and less likely to split. Its size and form is the same as that of Spectrum Supreme, and the plants have the same characteristics. The stems are of good length and fairly strong. The flowers are excellent keepers. In the Autumn and Spring the flowers are preferred to those of King Cardinal because of their size and superior keeping qualities.

\$7.00 per 100 \$60.00 per 1000

SPECTRUM SUPREME. This is still a popular red variety although it has been grown for years. It is a heavy producer of fine flowers of good size having deeply fringed petals. The stems are long. The flowers keep perfectly. The plants are vigorous and easy to grow. Its principal faults are that it splits freely at times, and when not grown properly may produce a weak stem. It is still a valuable commercial carnation.

\$6.00 per 100 \$50.00 per 1000

BEUERLEIN'S CRIMSON. The color is a trifle darker than that of Woburn. The flowers are of medium size, and are carried on medium length stems. The variety is very prolific, coming much earlier and freer than Woburn. The calyx does not split. This is a promising new variety.

\$8.00 per 100 \$70.00 per 1000

JOYCE. A new crimson variety having much larger flowers than Beuerlein's Crimson and containing a little more red in the petals. Under artificial light it has more life than most of the crimson varieties. It is very prolific, has a fine, long stem, and is an excellent carnation. Some splitting occurs.

\$8.00 per 100 \$70.00 per 1000

WOBURN. This was one of the first important crimson varieties, and it is still a leader in this color class. It is famed for its high quality blooms. It never splits, and seldom produces a poor flower. The blooms are large, and keep well. It is not as early as some others, but it produces well and usually commands premium prices in the large markets.

\$7.00 per 100 \$60.00 per 1000

PATENTED VARIETIES

The following varieties have been selected as the best of the patented carnations. They are owned by Baur-Stinkamp and Co., and patent agreements must be signed. We act as brokers for these varieties, and will be happy to take your order. We will gladly take your order for ANY of the patented varieties, but especially recommend the following.

KING CARDINAL. The loveliest shade of all of the red carnations. The vivid scarlet flowers are medium to large, with almost smooth petals. Stems are long and strong, and splitting is very rare. Plants are large and bushy. Production is high. Flowers are at their best during the winter.

\$12.00 per 100 \$100.00 per 1000

ROSALIE. A fine deep pink in the Ward color class. Has done very well with us. Flowers are of medium size, have good substance, have deeply fringed petals and keep splendidly. Plants are vigorous and free. The stem is long, and the calyx is firm. Our experience has been that the variety does best when grown indoors and benched before the plants become too large.

\$20.00 per 100 \$150.00 per 1000

SETH PARKER. We consider this to be the finest of the crimson varieties. The flowers are larger than any others in this color class, and they have more red coloring which gives life to the blooms under artificial light. The variety is long stemmed, splits very rarely, is a good keeper and produces well. The plants are bushier and more vigorous than most of the crimson varieties.

\$20.00 per 100 \$150.00 per 1000

NOVELTY VARIETIES

LOCHINVAR. The petals of this unusual novelty carnation are a rich garnet color fading to an orchid edge. Flowers are $2\frac{1}{2}$ to 3 inches in diameter, are semi-double, are carried on medium length stems and never split. Production is very heavy. The plants carry no surplus grass, and should be planted quite close. The foliage is narrow and thin, and cuttings are rather small. However, the variety is easy to grow. Our supply is limited.

\$12.00 per 100 \$100.00 per 1000

MARCHIONESS OF HEADFORT. One of the most beautiful novelty shades ever introduced. The petals are a cream white, overlaid with a bright, rich red. It is an English variety of the Pelargonium type, but both the flowers and the plants are superior to Pelargonium. The flowers measure 3 inches and more across, and are full centered. The plants are much bushier than those of Pelargonium. The stem is not long, but is straight and strong. The flowers keep well and blend beautifully in floral arrangements. They are especially fine for corsages. Our supply is very limited.

\$12.00 per 100 \$100.00 per 1000

SCARLET KING. The name is misleading, for the flowers are of the Pelargonium type having creamy white petals overlaid with bright scarlet. It is a sport of Pelargonium, and the plants have the same habits of growth. It should be planted closer than the average variety. The color is distinctive and appealing, and is very popular with retail florists. Our supply is limited.

\$12.00 per 100 \$100.00 per 1000

PELARGONIUM. The most widely grown and popular of the novelty carnations. The color is a white ground, overlaid on each petal with a crimson-maroon. The flowers are of good size and substance. The stems are quite long and stiff. The plants do not bush very much, and permit of close planting. The variety produces well, the calyx does not split, and the flowers are good keepers. PELARGONIUM will always command premium prices on almost any market.

\$10.00 per 100 \$90.00 per 1000

PHARAOH. A unique carnation, entirely different in color than any other novelty variety. The petals are a delicate shade of orange with a slightly pink tinting. The tips of each petal are fringed with red. There are no pencilings. The blooms are very large and full, often exceeding four inches, nevertheless splitting is very slight. The plants are very large, and branch freely almost without topping. Production is good, and the flowers usually command high prices. The stem is of medium length and stiffness.

\$7.00 per 100 \$60.00 per 1000

BARBARA BRIGHAM. A sport of Golden Wonder, having flowers which are a beautiful light apricot with pink pencilings. The form, size and habits of growth are the same as those of Golden Wonder. It is a good producer and keeper, and is a popular variety which combines delightfully in floral arrangements.

\$7.00 per 100 \$60.00 per 1000

GOLDEN WONDER. We consider this to be the best of the yellow variegated carnations. The color is sulphur yellow with deep pink pencilings. The flowers are of good size, full and beautifully formed. The petals are slightly fringed. The stem is of medium length. Splitting is slight, production is good, and the keeping quality is fine. The plants are bushy.

\$7.00 per 100 \$60.00 per 1000

MAINE SUNSHINE. This is the only clear yellow variety we know of which has been tested and is of commercial value. The flowers are of good size and are a clear sulphur yellow with no variegation at all. Production is high, the plants are of good size, the stem is long, although not especially stiff, some splitting occurs, the blooms keep and ship perfectly. We have tried many yellows, and MAINE SUNSHINE is the most valuable of any we have grown.

\$7.00 per 100 \$60.00 per 1000

A FEW SUGGESTIONS

The U. S. Department of Agriculture lists us as a Class 1A establishment with the privilege of issuing Japanese Beetle Certificates. We do NOT have to wash the roots of the plants, nor treat them with chemicals. If you come WITHIN the quarantine area and require a "B" Certificate, you should request this AT THE TIME YOU MAIL YOUR ORDER. We are not permitted to mail certificates after shipment has been made.

The cuttings you receive are ready for potting or flatting. Do not put them back in propagating sand. Ordinarily they will not require shading, but if they have been several days in transit and have softened up some, or if they are flatted up during warm, bright weather, a newspaper placed over the flat DURING THE HEAT OF THE DAY ONLY will help the plants to become established. Under no circumstances leave paper on the plants during dull weather or at night, and as soon as the roots have become established and the plants stiffen up, apply no further shade at any time.

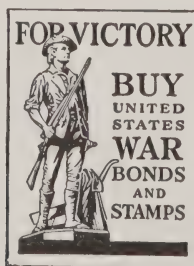
We do not recommend potting where flatting is possible. In some sections of the country potting is necessary, but plants are harder to carry properly in pots, will require more labor in pots, and will take up valuable bench space in pots. Flats do not have to be over 3 inches deep, and even 2½ inches will be sufficient. Provide a moderately rich soil with a pH of about 6.0.

Do not plant the cuttings in the flat or pot any deeper than they were in the sand. Press the soil firmly about the roots. Water heavily, and then allow the soil to dry out fairly well before watering again.

It is inadvisable to water young carnation plants overhead. Deep planting and overhead watering very often encourage serious disease problems. During very hot summer days, young carnation plants may safely be sprinkled overhead provided that there is no trace of fungus or bacterial disease on the plants and they will dry out completely before night. However, the benefit derived from overhead watering is not worth the risk involved from this practice.

Carnations are a cool crop. Keep your houses at 48 to 50 degrees at night. On cloudy days, keep your houses down to 55 degrees. On bright, cool days, run your houses as near 60 degrees as possible. Higher temperatures are all right on bright, warm days when plenty of ventilation can be provided. Carnations like a good circulation of air at all times, but should not be placed in a strong draft.

As a further aid to you in diagnosing and treating carnation diseases, we have described on the following pages the seven ailments which cause about 95% of the trouble in carnation houses. If you have other questions you would like answered, we will be happy to hear from you and to help you to the best of our ability.



TREATMENT OF INSECTS AND DISEASES

RED SPIDERS . . .

This is the worst insect pest with which carnation growers have to contend. There are scores of remedies, particularly sprays, many of which are worthless, and some of which are dangerous. By far the best method of control is by fumigation with naphthalene base compounds. *Liquid Fulex* is outstanding in this field. Control in the field, in mixed houses, or where only small areas are involved may be by spray or dust. It is preferable to spray as little as possible, for there are very few sprays which will not injure the plants if used frequently. Sprays and dusts kill by contact, and must be applied thoroughly. Rotenone sprays are generally safe and effective on carnations. Oily sprays should be avoided as these are likely to remove the bloom from the foliage. Syringing with a fine stream of water under pressure may be practiced when plants are small and on bright, warm days, but should never be done whenever any fungus or bacterial disease is present. Dusts have met with varying degrees of success, and must be used very carefully in hot weather in order to avoid damage.

APHIDS AND THRIPS . . .

These are comparatively minor problems, and are easily remedied, although thrips will continue to blow in from outside as long as ventilators are open. Nicotine in one form or another is the best cure. Nicotine fumigation every four or five days until the insects are cleaned up is the most effective means of control. Spraying with Paris Green and brown sugar is effective in the case of thrips, but this leaves the foliage dirty and sticky for months.

RHIZOCTONIA STEM ROT (*Rhizoctonia solani*)

Foliage becomes dull, losing green color; entire plant wilts suddenly. Stem near soil wet and soft; the shredded bark sloughing off from the slightest twist, exposing harder tissues beneath. Roots remain intact. Brown knots of fungus mold evident about decayed portion of stem and adhering soil. Is caused by a common mold fungus which inhabits most soil and soil-contaminated sand. *It is not carried in cuttings.* Ordinarily the mold is a harmless soil fungus, but under favorable conditions it becomes a serious disease. It thrives under excessively moist and warm conditions. Control is a matter of correct watering and airing, sanitation, shallow planting, soil sterilization and soil rotation. Acidity, alkalinity or fertility of soil within the limits of good plant growth are of no value in the control of the disease. Spraying is useless. Steam sterilization, or sterilization with tear gas, helps, but sterilized soil may easily become reinfected if plants are brought in from outside.

FUSARIUM BRANCH ROT (*Fusarium dianthi*)

Begins with the wilting of a single branch. Leaves are a dull green, then yellow and straw colored. The affected branch dries and shrivels. Infection at first is localized in the stem or branch near crotches or nodes. Injuries of one sort or another caused by careless handling, too rapid growth, topping, picking, etc., are essential for infection except where the disease has been carried with the cuttings. Upon cutting the branches lengthwise, the conductive tissue under the bark is seen to be yellowish or reddish brown extending *up and down following the sap channel.* If the branch is removed before the disease has progressed into the stem, the plant may possibly be saved. Later the brown color expands into the inner tissue of the stem and into the outer bark from the conductive tissue. When the stem is invaded, the branches on the infected side die, and ultimately the entire plant succumbs. The inside tissue of an invaded stem is dry and of a dull brown color, similar in appearance to dead timber. As the infection is usually aerial, soil sterilization is of little value, and there is no known spray which will prevent or cure it. Sterilizing benches, flats, soil and sand are sanitary

methods which are helpful, but do not expect to control Fusarium Branch Rot in this manner. Warm, moist conditions are favorable for the growth of the disease. Avoid excessive and overhead watering and injuries to plants. Provide plenty of air, and run houses cool. Discard those varieties that are particularly susceptible.

ALTERNARIA BLIGHT (*Alternaria dianthi*)

This disease is known as spot, blight or branch rot. Purple spots appear on leaves and flower parts, later browning and blighting the parts. Under moist conditions the blighted parts become overgrown with blackish or sooty masses of fungus. After benching, the fungus causes a prevalent branch rot centering at the nodes. Here the fungus causes dark colored spots or cankers which partially or completely girdle the branch. Ultimately the rot progresses deeper into the tissue, and the portion of the branch above wilts. The color of the invaded tissue is dark brown, almost black, and the color may extend from the bark to the wood. The discoloration extends *inward from the outside*, and does not follow the conductive tissue as does Fusarium. Infection takes place without the plant having first been injured, and almost always occurs in the field. Before branches wilt, the leaves are streaked or marked with whitish or light green areas. Certain varieties are more susceptible to the disease than others. Inside culture will usually eliminate Alternaria. Spraying with Bordeaux weekly from the time that plants go to the field until they are benched will form a chemical barrier between the plant and the fungus which is very effective. Alternaria is *not carried in the cuttings*, and any variety is likely to be attacked.

BACTERIAL LEAF SPOT (*Phytophthora Woodii*)

This disease is so rare in many sections that growers are likely to confuse it with alternaria blight or fairy ring, and therein lies its greatest danger. It is a foliage disease caused by a bacteria or microbe which progresses from the lower leaves upward, attacking the stem and bud only in very severe cases. If not checked, the plant becomes defoliated and will die. In any case, the plants will be checked and production arrested. The disease occurs *only in the presence of injuries*, but spiders, thrips, aphids, etc., will provide sufficient injury for the bacteria to gain entrance. It is, therefore, of vital importance that plants be kept free of insects. The development of the disease is slow at temperatures of 60 degrees or less, and very rapid at higher temperatures. The trouble is first indicated by the presence of small, oval spots of pale brown color. These spots are usually sunken, and soon become yellow with a dark green or purple margin. These spots may include the entire breadth of the leaf, and where spots are numerous, they have a tendency to grow together. Several spots ultimately cause the death of the leaf, in which case the leaf turns a yellow straw color, withers and dies, the spots retaining a rusty brown color. Greenhouses should be kept cool, dry and well ventilated. There must be no overhead watering of any kind. Fortunately the disease may be cured or prevented by use of a spray consisting of 3 pounds of zinc sulfate, 1½ pounds alum, 4 pounds hydrated lime, and a good spreader to 50 gallons of water. Dusting with fine sulphur is a further precaution which may be taken.

RUST . . . (*Uromyces caryophyllinus*)

Sulphur is the most effective preventative and cure for rust. Use a fine dusting sulphur, and apply it with a good blower. Use it on young plants as soon as the first trace of rust appears, and apply on bright, warm, days. Sulphur may safely be used once a week or oftener. In light soils it may cause a slight acid reaction, but this is easily overcome. In the field where dusting is impractical, lime-sulfur may be sprayed. Bordeaux or other copper sprays have very little effect on rust. The disease is so easily prevented or cleaned up that there is no excuse for a grower permitting his plants to become damaged by it. Keep plants dry, provide plenty of air, and run houses cool.

